**To:** Weis, Christopher (NIH/NIEHS) [E][christopher.weis@nih.gov]
**Cc:** hughes3@niehs.nih.gov[hughes3@niehs.nih.gov]; Hakkinen, Pertti (NIH/NLM) [E][hakkinenp@mail.nlm.nih.gov]; Koerner, John (HHS/ASPR/OEM)[John.Koerner@hhs.gov]
**From:** Clark, Becki
**Sent:** Tue 1/14/2014 5:55:06 PM
**Subject:** RE: Summary Review of the Eastman Studies on MCHM

Thanks, Chris. We are assembling a small group to review. When do you want our response? COB tomorrow okay or sooner?

Becki Clark, Deputy Director
Office of Ground Water and Drinking Water
Office of Water

-----Original Message-----
From: Weis, Christopher (NIH/NIEHS) [E] [mailto:christopher.weis@nih.gov]
Sent: Tuesday, January 14, 2014 12:13 PM
To: Clark, Becki
Cc: hughes3@niehs.nih.gov; Hakkinen, Pertti (NIH/NLM) [E]; Koerner, John (HHS/ASPR/OEM)
Subject: Summary Review of the Eastman Studies on MCHM

Becki,

Good to talk with you this morning and congrats once more on your new position as deputy director at EPA's DW and GW program.

Attached are the summaries of studies we've obtained from Eastman. These summaries were put together by Dr. Hakkinen at the National Library of Medicine. **Ex. 5 - Deliberative** **Ex. 5 - Deliberative** The National Library of Medicine is also scheduled to post this summary along with much more information about MCHM that they have gleaned. That information will be posted on the Hazardous Substances Data Bank (HSDB) on about Thursday.

Cheers!

Chris

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Data review:
MCHM is a mineral frothing chemical. MCHM has an estimated vapor pressure of 5.8X10-2 mm Hg at 25 degrees C meaning that it will exist as vapor in air. Volatilization from water surfaces is expected to be an important fate process based upon this compound's estimated Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 7 days and 51 days, respectively.

On Thursday, January 9, 2014 emergency response operators from the Centers for Disease Control in cooperation with local and State health authorities established an interim urgent health advisory based upon limited information available at the time. This health advisory was used to issue a warning to users of the local water district to avoid all contact with domestic water. Since the establishment of the emergency advisory, State and Federal officials have identified several additional studies on the toxicology of MCHM. Those studies of pure MCHM and crude MCHM (contains MCHM as the main component), though proprietary, are briefly summarized below:

1) Crude MCHM. Ames test for mutagenic potential. Test used multiple Salmonella typhimurium strains and one E. coli strain, with six doses, and with and without S9 mix to study impact of possible metabolism of activity. No increase in revertants. A repeat study confirmed results.

2) Crude MCHM. Two-week daily dermal application. . Male and female rats dosed at either 0, 100, 500, and 2000 mg/kg/day, six hours/day for 13 consecutive days. There was dermal irritation at all treatment levels and thus no NOEL. Based on the absence of significant histopathology and serum clinical chemistry changes, 2, 000 mg/kg considered as the NOEL for systemic toxicity. (One focus was to look at hematuria as a possible toxic effect seen in earlier acute dermal study).

3) Crude MCHM acute single dose dermal. A single dose of 2000 mg/kg was applied to male and femalerats, with a 14-day observation period. Dermal irritation was observed and the dermal LD50 was greater than 2,000 mg/kg. Crude MCHM was classified as slightly toxic.

4) Crude MCHM acute single dose oral. . Male and female rats were dosed with. 500, 1000, and 2000 mg/kg, followed by a 14-day observation period. The acute LD50 was calculated as 933 mg/kg for males and 707 mg/kg for females . Crude MCHM was classified as slightly toxic and harmful if swallowed (red urine among effects noted, but was not seen in a repeat study).

5) Pure MCHM 28 day daily oral. . Rats received 0, 25, 100, and 400 mg/kg/day, five days a week, for 4 weeks. The NOEL was 100 mg/kg/day.

6) Crude MCHM acute single dose oral (repeat of earlier study). Single oral dose to female rats. (To look at hematuria as a possible toxic effect as seen in other study). The LD50 was calculated to be 500 mg/kg.

7) Pure MCHM acute battery. .

a) Acute single dose oral toxicity. Male and female rats dosed at. 625. 1250, and 2500 mg/kg. The estimated LD50 was 1768 mg/kg in malesand 884 mg/kg in females.
b) Acute single dose dermal exposure. Male and female rats. Dosed at 2, 6, and 20 ml/kg. MCHM was irritating to skin at as low as the 2 ml/kg dose level, but only in females at this dose.
c) Acute single exposure dermal irritation. Guinea pigs dosed at 0.5 ml for to abdomen, covered with occlusive wrapping for 24 hours. There was a 48 hour observation period after the wrap was removed. MCHM exposure led to strong skin irritation.
d) Acute toxicity, repeated application to skin. The backs of guinea pigs were exposed to. 9 doses of 0.5 ml of MCHM drop on. over, 11 days.. There was exacerbation of the irritant response with (multiple) application
e) Acute toxicity, evaluation of skin sensitizing potential. Male guinea pig footpads were exposed to 0.05 ml of a 1.0% solution MCHM in adjuvant (FCA) for Induction.. No sensitization was observed after a challenge application and MCHM was concluded to have. a low potential to cause human sensitization.
f) Acute toxicity, eye irritation. One dose of 0.1 ml of MCHM was paced onto rabbit eyes, followed by washing or no washing... The washed eyes showed slight irritation and the. unwashed eyes showed moderate irritation. MCHM was concluded to be a moderate irritant.
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